forming an air layer having large magneto-resistance is provided in a vicinity of an axial center of the rotary disc so as to extend from an outer circumferential portion of the rotary disc toward the rotating shaft, and a bottom portion of the deep groove is located to be closer to the above-mentioned rotating shaft than inside magnetic pole teeth of the above-mentioned electromagnetic stators. In addition, according to the present invention, the above-mentioned deep groove is formed all over the outer circumference of the above-mentioned rotary disc. In addition, according to the present invention, fan-shaped through holes for forming an air layer having large magneto-resistance are provided in the vicinity of an axial center of the above-mentioned rotary disc so as to extend from an outer circumferential portion of the above-mentioned rotary disc to the above-mentioned rotating shaft, while walls of rotary disc pieces located on axially opposite sides of this through holes are formed as solid walls having no through hole axially.

Page 10, delete paragraphs 2 and 3 and replace with the following:

Further, according to the present invention, the deep groove is formed all over an outer circumference of the rotary disc, while an inner diameter of the a deep groove for forming an air layer having large magneto-resistance is provided in a vicinity of an axial center of the rotary disc so as to extend from an outer circumferential portion of the rotary disc toward the rotating shaft, and a bottom portion of the deep groove is located to be closer to the above-mentioned rotating shaft than inside magnetic pole teeth of the above-mentioned electromagnetic stators. In addition, according to the present invention, the above-mentioned deep groove is formed all over the outer circumference of the above-mentioned rotary disc. In addition, according to the present invention, fan-shaped through holes for forming an air layer having large magneto-resistance are

provided in the vicinity of an axial center of the above-mentioned rotary disc so as to extend from an outer circumferential portion of the above-mentioned rotary disc to the above-mentioned rotating shaft, while walls of rotary disc pieces located on axially opposite sides of this through holes are formed as solid walls having no through hole axially.

Page 12, delete paragraph 1 and replace with the following:

As a result, magnetic flux and leakage flux entering the inside of the rotary disc through the surface of rotary disc not opposed to any one of the inside magnetic pole teeth and the outside magnetic teeth of the electromagnetic stators are relieved so that the magnetic flux density in the inside magnetic pole tooth and the outside magnetic pole tooth of each of the electromagnetic stators can be increased. Accordingly, the electric energy supplied to the electromagnetic coils can be effectively utilized to control the position of the rotating shaft.

Pages 12-13, delete paragraph 2 and replace with the following:

Further, according to the present invention, slits large enough to increase radial magneto-resistance are provided at several places in outer circumferential portions of the electromagnetic stators. Accordingly, magnetic interference between two magnetic circuits formed by the respective electromagnetic stators is relieved. As a result, it is possible to relieve the formation of an abnormal magnetic circuit extending from one electromagnetic stator to the other electromagnetic stator through the casings or the collar and extending from the other electromagnetic stator to the one electromagnetic stator through the rotor disc. Thus, electric energy supplied to the electromagnetic coils is effectively utilized to control the position of the rotating shaft so that it is possible to improve the control performance.

Page 13, delete paragraph 1 and replace with the following:

Further, according to the present invention, an outer circumferential groove for forming an air layer having large magneto-resistance is provided in a portion of each of the outside magnetic pole teeth of the electromagnetic stators not opposed to the rotary disc so as to extend axially from a side where the rotary disc is located. Accordingly, magnetic interference between two magnetic circuits formed by the respective electromagnetic stators is relieved, and the magnetic flux density in the inside magnetic pole tooth and the outside magnetic pole tooth of each of the electromagnetic stators can be increased. As a result, it is possible to relieve the formation of an abnormal magnetic circuit extending from one electromagnetic stator to the other electromagnetic stator through the casings or the collar and extending from the other electromagnetic stator to the one electromagnetic stator through the rotor disc. Thus, electric energy supplied to the electromagnetic coils is effectively utilized to control the position of the rotating shaft so that it is possible to improve the control performance.

Page 14, paragraph 1 and replace with the following:

Further, according to the present invention, an outer diameter of each of the electromagnetic stators is formed to have substantially as large as an outer diameter of the rotary disc, and a ring made of a non-magnetic material having a radial thickness enough to form a layer with large magneto-resistance is interposed between an outer circumferential portion of each of the electromagnetic stators and an inner circumferential portion of corresponding one of the casings to which the electromagnetic stator is attached. Accordingly, two magnetic circuits formed by the respective electromagnetic stators are insulated from each other magnetically

perfectly, and the magnetic flux density in the inside magnetic pole tooth and the outside magnetic pole tooth of each of the electromagnetic stators can be increased. As a result, it is possible to more surely prevent the formation of an abnormal magnetic circuit extending from one electromagnetic stator to the other electromagnetic stator through the casings or the collar and extending from the other electromagnetic stator to the one electromagnetic stator through the rotor disc. Thus, electric energy supplied to the electromagnetic coils is effectively utilized to control the position of the rotating shaft so that it is possible to improve the control performance.

Pages 18-19, delete paragraph 2 and replace with the following:

Then, as a characteristic portion of the present invention, the deep groove 16 is provided near the axial center of the rotary disc 2 fixedly attached to the rotating shaft 1, so as to cover the outer circumference of the rotary disc 2. The inner diameter of the deep groove 16 is formed to be smaller than the inner diameter of each of the inside magnetic pole teeth 11. That is, the deep groove 16 is located so that the bottom portion thereof is closer to the rotating shaft 1 than the inside magnetic pole teeth 11 of the electromagnetic stators 7a and 7b. Due to this deep groove 16, an air layer is formed with a certain suitable width in the axial direction so as to have sufficiently large magneto-resistance. Accordingly, the one magnetic circuit 13 formed by the electromagnetic stator 7a and the rotary disc 2 and the other magnetic circuit 13 formed by the electromagnetic stator 7b and the rotary disc 2 are insulated from each other magnetically. As a result, formation of an abnormal magnetic circuit designated by the reference numeral 14 in Fig. 9 can be relieved without increasing the number of parts, and a magnetic circuit is made independent for each of the electromagnetic stators 7a and 7b. Thus, the electric energy supplied

to the electromagnetic coils 10 can be used effectively for position control of the rotating shaft 1.

Page 20, delete paragraph 4 and replace with the following:

That is, in this Mode 2, as shown in Figs. 2A and 2B, the rotary disc 2 has, on its opposite sides, sleeves 6 to be fixedly attached to the rotating shaft 1. Slit-like through holes 17 extending from the outer circumferential portion of the rotary disc 2 to the outer circumferential portion of the rotating shaft 1 are provided at several places in the vicinity of the axial center of the rotary disc 2. Incidentally, these through holes 17 are formed in positions where the through holes 17 do not unbalance the rotary disc 2 when the rotary disc 2 rotates at a high speed. In addition, an air layer formed by each of these fan-shaped slit-like through holes 17 is formed with a certain suitable diameter to have sufficiently large magneto-resistance. In addition, in Fig. 2B, the reference numeral 17a represents a portion 17a where no slit-like through hole 17 is provided. The portion 17a plays a role of connection between rotary disc pieces 3 and 3. Incidentally, the other configuration is similar to that in Mode 1, and hence description thereof will be omitted.

Page 35, delete paragraph 2 and replace with the following:

In addition, the present invention is not limited to the above-mentioned respective modes, but includes a wide variety of other modifications. For example, in Node 2, not always by through holes, but by a deep groove which is deeper than the inner diameter of the inside magnetic pole teeth 11 of the electromagnetic stators 7 and which does not reach the outer circumferential portion of the rotating shaft 1, it is also possible to attain the intended objects.

Page 37, delete paragraph 2 and replace with the following:

Further, according to the present invention, a distance between a surface of the rotary disc located in a position not opposed to any one of an inside magnetic pole tooth and an outside magnetic pole tooth of corresponding one of the electromagnetic stators and a surface of the corresponding electromagnetic stator opposed to the surface of the rotary disc is formed to be larger than a distance between a surface of the rotary disc located in a position opposed to each of the inside magnetic pole tooth and the outside magnetic pole tooth of the corresponding electromagnetic stator and a surface of the corresponding electromagnetic stator opposed to the surface of the rotary disc. Accordingly, magnetic flux entering the inside of the rotary disc through the surface of rotary disc not opposed to any one of the inside magnetic pole teeth and the outside magnetic teeth of the electromagnetic stators, and leakage flux escaping to an atmosphere are relieved, so that the magnetic flux density in the inside magnetic pole tooth and the outside magnetic pole tooth of each of the electromagnetic stators can be increased. Accordingly, the electric energy supplied to the electromagnetic coils can be effectively utilized to control the position of the rotating shaft.

Pages 39-40, paragraph 2 and replace with the following:

Further, according to the present invention, an outer diameter of each of the electromagnetic stators is formed to have substantially as large as an outer diameter of the rotary disc, and a ring made of a non-magnetic material having a radial thickness enough to form a layer with large magneto-resistance is interposed between an outer circumferential portion of each of the electromagnetic stators and an inner circumferential portion of corresponding one of

the casings to which the electromagnetic stator is attached. Accordingly, two magnetic circuits formed by the respective electromagnetic stators are insulated from each other magnetically perfectly, and the magnetic flux density in the inside magnetic pole tooth and the outside magnetic pole tooth of each of the electromagnetic stators can be increased. As a result, it is possible to surely prevent the formation of an abnormal magnetic circuit extending from one electromagnetic stator to the other electromagnetic stator through the casings or the collar and extending from the other electromagnetic stator to the one electromagnetic stator through the rotor disc. Thus, electric energy supplied to the electromagnetic coils is more effectively utilized to control the position of the rotating shaft so that it is possible to improve the control performance.

Page 40, delete paragraph 1 and replace with the following:

Further, according to the present invention, a collar made of a non-magnetic material for relatively positioning where the pair of electromagnetic stators are attached is provided between the pair of electromagnetic stators. Accordingly, two magnetic circuits formed by the respective electromagnetic stators are insulated from each other magnetically. As a result, it is possible to surely prevent the formation of an abnormal magnetic circuit extending from one electromagnetic stator to the other electromagnetic stator through the collar and extending from the other electromagnetic stator to the one electromagnetic stator through the rotor disc. Thus, electric energy supplied to the electromagnetic coils is effectively utilized to control the position of the rotating shaft so that it is possible to improve the control performance.